scribed; and it did not get into the city proper at all, notwithstanding the constant intercourse, and that "many who sickened were brought to the city and died."[1] A more singular account of the origin of a disease has never, we venture to say, been heard of, the floating bedding, near St. Augustine, 1821, as related by Dr. Strobel, not excepted.

A Charleston physician of reputation, in active practice, whose name would gladly be given were we at liberty, gave us the following account:—

> "We, who do not credit that Hewes could introduce the fever into Wolfe Street and vicinity in the manner stated, believe the cause to have been (in addition to bad drainage and bad police, the intense heat, and the heavy rains) the cutting down and removing, in midsummer, a large mound of earth and rubbish, which had been allowed to accumulate. The fever was local, much of it severe bilious remittent, and no one took the disease, although several sick persons were removed to other and more healthy localities in the city."

ART. V.—*Pulmonary Lesion treated as an event arising in the progress of Constitutional Decline under the Tubercular Diathesis.* By J. P. HALL, M.D., of Glasgow, Kentucky.

THE topics with which I design more especially to deal have reference to the events to which tubercular, as distinguished from strumous diathesis, gives rise; but, under the conviction that there is here implied a distinction when there does not exist any essential difference, I will occupy a brief space in explanation of my peculiar views. But I must content myself with a bare statement of conclusions, without adducing the reasonings by which my position is supported.

To state that the habit or diathesis resulting in the elimination and deposition of cacoplastic and aplastic products—establishing pulmonary phthisis in one case, in another scrofula, and in a third tabes mesenterica or cachexia Africana—is identical, would be assuming grounds no broader than could be sustained by well-established facts, as I verily believe; yet such a view would seem to require qualification.

The above enumerated morbid states clearly present diversified pathological features, and have accordingly been arranged into nosological varieties; nevertheless, I regard them as the offspring of a common progenitor. The features by which the individuals are ultimately so easily distinguishable, are the result of, and determined by predisposition, temperament, manner of life, &c. The prevailing diathesis or dyscrasia constitutes a general disposition to disease, which the local manifestation or the peculiar tissue which may become the seat of structural lesion, in the progress of constitutional disorder, indicates the proximate pathological distinction.

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[1] Dr. Simons.

From the remotest dawnings of medical philosophy up to the period when theories are shaped by the teachings of men of our own day, struma, phthisis, and other allied diseases have been, in some sort, treated of as bearing a certain relation to a pre-existing state of constitutional depravity. Cachectic habit, strumous diathesis, tubercular predisposition, &c., are the designating terms that have been employed, according as the incipient indications were to develop one or another of the definite forms of resultant structural disease.

In all of this there is an inherently distinct and dissimilar morbid element implied, capable of exercising a specific control over the events of disease, independently of constitutional idiosyncrasy. Now, to my mind, the proposition resolves itself into this: that, prior to the development of that assemblage of morbid phenomena, expressive of a local lesion and susceptible of a distinctive appellation, as tubercular consumption, scrofula, &c., there is not a vitiating agent at work endowed with peculiar and intrinsically dissimilar properties, but that diversities inherent in the economy and the peculiar influences brought to bear in the individual instance must essentially determine the specific character of the final disease.

I will now proceed to a consideration of that peculiar perversion of the nutritive functions resulting in tubercular degeneration of the pulmonary structure—regarding the pulmonary implication as merely constituting a prominent event, although usually a fatal event, in the progress of the general morbid actions.

We are not accustomed to witness that group of morbid phenomena, exhibited upon the supervention of material change in the pulmonary structure, constituting true phthisis pulmonalis, developed independently of a prior departure from health; yet, until signs and symptoms have demonstrated the existence of such structural lesion, we are taught not to recognize an instance of absolute disease, but rather a negative condition of health.

The doctrine to which I hold, and upon which I am obstinately inclined to act, is, that the organic implication is only a local event, developed in the progress of a series of general morbid actions, and to subserve a salutary end. But in order correctly to appreciate those laws, to the operation of which the dissolution of tissue is due, they must be studied in connection with phenomena displayed in the processes going forward in the sources which originate organized tissues.

According to the most generally received physiological doctrines, the ultimate structure of the animal tissues consists in minute cell-formations and cell-germs; that these primordial cells and nuclei are capable of reproduction so long as they are supplied from the blood with appropriate organizable materials; the plastic elements of this fluid being resolved into nucleated cells also. When the entire group of organic functions are so perfectly performed as to place the animal body in a thoroughly normal condition, there is a perpetual disintegration and reproduction of cell-structures; while one process of the economy destroys another repairs, so that as long as this state of healthful integrity obtains there can take place no material diminution of the original cell supplies, but any interference to the functions of nutrition must necessarily arrest their production, and, as the process of disintegration is still going forward, the result cannot be otherwise than a rapid waste of tissue.

Hence the primary forms assumed in the processes of developing solid animal tissue are traceable to a sanguiferous source, thereby assigning to the circulating current an instrumentality of such essential importance, that without it vital changes must at once stop, and vital phenomena cease to be displayed. The blood, then, is the universal *pabulum vitæ,* the grand source of formative supply for the fashioning of the epithelium cilia to the formation of those intricate structures whose exercise gives rise to the complex phenomena of voluntary motion and thought; while from the same source are drawn materials for continued structural maintenance.

But that the purposes of normal organization be answered, a completely balanced set of machinery is requisite, as well as a due supply of assimilative materials; the latter, by the exercise of the former, to be elaborated and converted into those primary tissues whose aggregation forms a complete organism.

A set of organs otherwise capable of the most complete assimilative integrity, without appropriate organizable elements subjected to their elaborating functions, and the formative process, must prove an abortion, no less than would be the case on the other hand with a due supply of the materials of nourishment in the absence of functional apparatus adequate to the changes to be consummated in assuming the forms and properties of vital tissue. For an organism, after being placed in circumstances every way conducive to its physiological welfare, to maintain these circumstances implies the exercise of very many vital as well as physical forces; but to particularize minutely would be foreign to my present object.

The conditions essential to the elaboration of a pure current of vital fluid, the changes through which this fluid must pass in view of its adaptation to the physiological wants of the economy and the pathological modifications of which it is susceptible under the multiplicity of morbid influences to which it is exposed, constitute elements of prime interest to an inquiry such as we are engaged with; but opportunity permits me to devote, at present, only a passing remark to some of them.

The component elements of the plastic fluid, by which the several corporeal tissues are traversed, and from which they derive their supplies for growth and renovation, are supposed to exist in such relations as will best fulfil the purposes to be answered in the healthy economy. At a given period in the progress of functional events, this equable and perfect relation no longer subsists between the sanguiferous elements; the fibrinous element ceases to be duly elaborated, as evinced in the impaired tone and inelasticity of the tissues; the abnormally low proportion of red corpuscles gives rise to pallor and other indications of a general state of asthenia.

The rich materials of nutrition formerly abounding in the vital fluid are no longer retained; the cell-germ, which was formerly conveyed to the remote tissue and deposited as the nucleus of a plastic structure, has been replaced by the degraded element, susceptible of no higher organization than the cacoplastic and aplastic product. The ordinary nutritive process has undergone a complete metamorphosis; the plasticity of the blood has degenerated into dyscrasia; and the plastic forces, instead of their wonted compliance with the laws of normal organization, are now addicted to flagrant vices. If we consider how prejudicial to the vital apparatus must be the effects exerted through the blood, thus vitiated, conveying to the remotest recesses of the organism extraneous materials of a highly offensive character, we may readily perceive how absolutely indispensable to the continued operations of the economy is the office to which nature has doomed the lungs, or it may be a less vital organ. The economy sustains not only a negative injury in the arrest of plastic forces growing out of a deficiency of organizable constituents, but the positive evils resulting from noxious elements present, demand their speedy withdrawal, and the organ or organs evincing the greatest proclivity to participate in the progressing decay become a receptacle for the effete deposit.

As would, *à priori*, be expected, the great depurating organs, the lungs, seldom fail to become the chief instruments in the process of ridding the system of the excrementitious materials we have described. And if we reflect how vitally dependent upon the integrity of the pulmonary function is the adequate preparation of the blood for the uses which it is destined to serve in the economy, we are at once prepared for the series of perverted actions and torpid functions made manifest. The abnormal elements which give rise to the blood-dyscrasia finding efficient emunctories in the lungs, the vitalizing functions of these organs become impaired in consequence of the impediment offered to respiration by the amorphous deposit, which, by still further depraving the quality of the nutritive current, accelerates the elimination of plastic elements, thereby redoubling the burthen of the emunctories, either disposition reacting upon and aggravating the other, or alternately becoming cause and effect, until the elaborating power is paralyzed, and molecular nutrition permanently arrested.

The proximate element of disease in the peculiar constitutional habit characterized as tubercular diathesis, under which the functions of the body are so extensively involved in deviations from their wonted exercise in health, consists in the transformation of plastic blood into a fluid not only notably deficient in organizable constituents, but prone to the elimination of products in the highest degree embarrassing to the operations of the vital apparatus. Those materials so essential to the maintenance of a perpetually changing mechanism are not merely withheld, but the blood has become the medium of bringing into contact with the delicate tissues ingredients directly subversive of physiological relations, and capable of effecting the dissolution of existing tissues. Such organ as may predominate in selective affinity for the degraded element becomes a scavenger for the depraved circulation, affording a receptacle of deposit for the eliminated tuberculous matter.

Although it may seem a melancholy alternative, yet the organic lesion is an event of absolute necessity; an event salutary in its design, but direful in its consequences. In the progress of a pre-existing constitutional malady there has been created an office, associated with which are duties the performance of which involves the self-sacrifice of whatever organ assumes them, yet they must be performed, else speedier and more certainly fatal results ensue. Should this fatal service have been assumed by the pulmonary organs, as by far most frequently happens, upon the lapse of a period of uncertain duration, the function of these organs becomes manifestly impeded; the work so extensively involving the welfare of the body, even its existence, ceases to be adequately performed; efforts are now provoked for the expulsion of the accumulating burthen, and it is expelled; but alas! the source from whence the deposit is supplied yields with continually increasing lavishness. The *materies morbi*, which could not, with impunity, be retained, diffused throughout the circulating current, must prove a canker to the reservoir upon which it is concentrated; and at last nature's provision, which for a time held forth the promise of protective relief at least, becomes impotent; the lungs decay; the vital fabric, attenuated and exhausted, succumbs.

Thus it is that the hand, so gently laid on at first, gradually and insidiously but firmly tightens its grasp until the victim is completely crushed.

The morbid alterations which have been but imperfectly traced clearly originate in a lesion of nutrition; but this lesion does not, in every instance, by far, lead to the development of the event which entitles the morbid state to the denomination of tubercular consumption. But if the incipient tendency does progress to the establishment of the event, or pulmonary lesion, we may uniformly, by retracing the steps by which disease has advanced, convict the nutritive system of delinquencies, bearing, to the *event*, the relation of primary cause. Not a single essential morbid change arising in the progress of the original diathesis could have been developed independently of this relation. No process of argumentation could demonstrate to my mind that a tubercle was ever formed independently of a prior state of disease.

A tubercle is an eliminated morbid product, and must of necessity be the result of a morbid action engendered by a still further antecedent diseased impulse.

Having already extended this communication beyond the limits originally contemplated, I will conclude by offering a few very general reflections as to therapeutical relations.

The first indication is to remove the constitutional disease, or rather correct the diathesis; thereby averting the untoward event which its final progress involves, namely, organic lesion of the respiratory apparatus. If this event should not have been forestalled, the second step indicated is still to reclaim the constitution from original vices as an absolute condition to the permanent arrest and repair of organic lesion.

The engrossing idea of structural lesion must give place to more extended principles of investigation, else therapeutical deductions arrived at can only serve to alleviate and retard, while the problem of restoration must remain unsolved in reference to the ravages of tubercle.

Remedial systems must be predicated upon a broader basis than is afforded by stethoscopic disclosures. So far as regards a strictly pathological diagnosis, no one has a higher appreciation of the utility of this instrument than myself; but when the diagnosis sought is one from which wholesome, sound, therapeutical deductions are to be drawn, its value rapidly degenerates into inutility. The doctrine that I hold, and which I would inculcate, is, that the disease designated pulmonary phthisis does not originate in the pulmonary structure; that the structural lesion here is an event rendered inevitable in the progress of a pre-existing morbid habit; and that no process of exploration, it matters not with what degree of accuracy the condition of the lungs may be revealed, if thus restricted, can materially aid in supplying data for efficient remedial procedure. In this I would not be understood to intimate that the state of the lungs should be unheeded, or that this accurate method of determining what that state is must be discarded; yet such information, for the most part, only enables us to estimate the gravity and general import of the case, while an expansive field beyond must be scrutinizingly traversed for such discoveries as can be made available to the aims of salutary treatment.

Therapeutical measures must be shaped with the fact constantly in view, that the structural lesion is a consecutive event, and that the indications to be fulfilled are derived, not from the manifestation of a single organ upon which stress has incidentally fallen in the progress of a more general pre-existing functional lesion, but the expressions of a morbid organism constitute the indications to be sought and obeyed. The process of organization begins with the cytoblast, and here it is that the first link is wrought in the chain of morbid events, displayed in the progress of those functional and organic changes which mark the stages of tubercular consumption from the incipient diathesis to the period of its latest ravages.

There is, probably, no other disease, the history of which furnishes a commentary upon medical art, more justly humbling to the pride of its votaries than the one under consideration. No lengthened argument, no array of authentic testimony, is wanting to substantiate the assertion that the present state of our science affords no resources worthy to rank as remedies in the armory of therapeutical weapons.

The most judiciously ordered remedial systems which science, wisdom, and experience have been capable of devising, have most signally failed in conferring upon the melancholy victim of consumption the welcome boons which it is the mission of the healing art to bestow. When we remember that this insufficiency of our art leaves to an undisturbed progress a relentless monster whose ravages so fearfully contribute to abbreviate the span of human existence, we cannot, as members of an enlightened and philanthropic profession, fail to be impressed with the exalted nature of every effort, the tendency of which is to advance us a step in the pathway of useful discovery. The inquiry is a noble one, and will conduct the inquirer to a fertile field; but he must go forth prepared to break the surface.

This article has unavoidably partaken of a discursive character; many highly interesting details have been altogether omitted, and those noticed have been introduced regardless of system or order; but if the line of inquiry which I have attempted to indicate has been made obvious, more especially if the claims which I am persuaded should be allowed it have been in the least advanced, my main object has been achieved: for I verily believe, and willingly commit to record the opinion, that if in the progress of medical discovery, the great desideratum—the successful treatment of tubercular consumption—which has so long and so effectually baffled the champions of the noblest science relating to earthborn things should yet be attained, the solution of the mysterious problem will not be due to the stethoscope, auscultation, or percussion.

ART. VI.—*Inquiry into the Physiology of the Organic Nervous System.*

By ISAAC CASSELBERRY, M. D., Evansville, Ind.

EVERY material of the universe consists of *matter in motion.* This motion is termed *force.* Heat, light, and electricity are only states of matter. When a bar of iron is heated, its molecules are thrown into undulations which are propagated with definite form and character to contiguous particles of atmosphere, and from them to the hand or thermometer.

The motions of light, electricity, sound, colour, &c., are entirely analogous to those of heat, and the manifestations which they all present are dependent on the form of the substance from which they are evolved.

The causative motions must not be supposed to involve any transference of particles from point to point, which is the kind of motion most commonly recognized by our senses. There is a wide difference between the motions of a wave and the motions of the particles among which it is passing.

When we disturb the middle of a watery surface, circular waves are propagated from the centre to the circumference of the surface. A feather, or other light body placed upon the waves, is not drifted forward with them, but it remains motionless. We know nothing of matter itself; all our knowledge of it is confined to its motions. There is no such a thing as a vacuum; the term has only a relative import. A substance is heavy or light, hot or cold, wet or dry, green or red, according to the form of motions